

# Glucose self-monitoring: Think twice for type 2 patients

For patients with newly diagnosed type 2 diabetes, self-monitoring may do more harm than good

## Practice changer

Stop routinely recommending blood glucose self-monitoring for patients with newly diagnosed type 2 diabetes. Self-monitoring does not improve glycemic control for patients who are not taking insulin, and it increases the risk of depression.<sup>1</sup>

### Strength of recommendation

B: Single well-done randomized controlled trial (RCT)

O’Kane MJ, Bunting B, Copeland M, Coates VE; ESMON study group. Efficacy of self monitoring of blood glucose in patients with newly diagnosed type 2 diabetes (ESMON study): randomized controlled trial. *BMJ*. 2008;336:1174-1177.

## ILLUSTRATIVE CASE

Two weeks ago, you informed your patient—a 53-year-old man with a body mass index of 28.4—that he has type 2 diabetes. Since then, he has seen a nutritionist and begun exercising regularly. His hemoglobin A1c (HbA1c) is 7.7%. You recommend that he begin taking metformin. The patient is worried about the potential for oral antidiabetic agents to cause hypoglycemia. He’s aware that many patients with diabetes monitor their blood sugar levels at home and wants to know

if he should, too. You wonder whether it’s necessary, or even advisable, to initiate self-monitoring at this time.

For patients with type 2 diabetes, self-monitoring of blood glucose makes intuitive sense. Theoretically, it reinforces self-management behaviors, promotes adherence to the prescribed medication regimen, and leads to better glucose control. It seems obvious, too, that patients taking medications intended to lower blood sugar need to be aware of their glucose levels so they can take action to reduce the risk of complications.

But things that make sense intuitively do not always stand up to scrutiny. New high-quality evidence suggests that for those with newly diagnosed diabetes, self-monitoring of blood glucose may do more harm than good.

## More questions than answers

While it is generally accepted that glucose self-monitoring is useful for those with insulin-treated type 2 diabetes,<sup>2-4</sup> evidence supporting the practice for patients with diabetes who do not require insulin is limited. Two recent meta-analyses of RCTs<sup>5,6</sup> found that self-monitoring

Michael D. Mendoza, MD, MPH, and  
John Hickner, MD, MSc  
Department of Family Medicine,  
The University of Chicago

### PURLS EDITOR

Bernard Ewigman, MD, MSPH

Department of Family Medicine  
The University of Chicago



**Do you recommend self-monitoring of blood glucose for patients with type 2 diabetes who do not require insulin?**

- Always
- Usually
- Sometimes
- Rarely
- Never

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of blood glucose achieves a statistically significant reduction of 0.4% in HbA1c; the quality of the studies, however, was limited. A well-designed RCT was needed, the researchers concluded, to settle questions about the value of self-monitoring.

The most recent Cochrane review<sup>7</sup> of self-monitoring reached a similar conclusion: The reviewers called for additional research into the benefits of self-monitoring for patients with diabetes who do not need insulin. The reviewers also emphasized the need for information on patient-related outcomes such as quality of life, well-being, and satisfaction.

#### **Are recommendations out of step?**

Despite the lack of definitive evidence, the Department of Health and Human Services calls on us to increase the proportion of patients with diabetes who monitor their blood sugar at least once daily to 60% as part of its *Healthy People 2010* initiative.<sup>8</sup> The American Diabetes Association states that self-monitoring of blood glucose may help patients taking oral antidiabetic agents achieve glycemic goals.<sup>9</sup> And the International Diabetes Federation recommends that self-monitoring of blood glucose be offered to all people with type 2 diabetes taking insulin or oral agents—and be part of the patient education that is given to all those who are newly diagnosed.<sup>10</sup>

But all of these groups may need to rethink their recommendations in light of the latest findings from the O’Kane RCT.

#### **STUDY SUMMARY**

##### **■ Self-monitoring has little effect on glycemic control**

O’Kane and colleagues conducted a prospective RCT comparing self-monitoring versus no monitoring among 184 people with newly diagnosed type 2 diabetes.<sup>1</sup> Patients were randomized to the self-monitoring or control group for 1 year,

with clinic visits at 3-month intervals. Those who were already taking insulin or had engaged in self-monitoring of blood glucose were excluded.

At baseline, there was no significant difference in HbA1c, age, or sex between the 2 groups. Participants in both groups underwent identical diabetes education programs throughout the study period and received dietary and medical management based on the same treatment algorithm. Patients whose baseline HbA1c was >7.5% received metformin, followed by the sulfonylurea gliclazide if they did not reach target at the maximum dose of metformin. There was no significant difference in medication use at baseline or at 12 months.

Patients in the self-monitoring group were given glucose monitors and asked to record 4 fasting and 4 postprandial capillary blood glucose measurements per week. They were also taught to monitor and interpret blood glucose readings, and to respond appropriately to high or low readings.

At each follow-up visit, patients underwent blood tests for HbA1c, lipids, and electrolyte levels and completed questionnaires about treatment satisfaction, attitudes about diabetes, and levels of depression, anxiety, and well-being. Adherence to self-monitoring was verified by downloading meter readings. The dropout rate was low (2.2%), and adherence in the self-monitoring group was high. Study results were assessed using intent-to-treat analysis.

**HbA1c fell in both the self-monitoring and control groups**, with no significant differences at any point. The mean (standard deviation) value at 12 months was 6.9% (0.8%) in the self-monitoring group, compared to 6.9% (1.2%) in the control group, with a 95% confidence interval for the change in HbA1c of -0.25% to 0.38%. Throughout the study period, there was no difference in use of oral hypoglycemic medications or reported hypoglycemia.

#### **FAST TRACK**

**At the end of 12 months, the mean HbA1c was 6.9% for both the self-monitoring and control groups**

#### **PURLs methodology**

This study was selected and evaluated using FPIN’s Priority Updates from the Research Literature (PURL) Surveillance System methodology. The criteria and findings leading to the selection of this study as a PURL can be accessed at [www.jfponline.com/purls](http://www.jfponline.com/purls).

## Self-monitoring linked to depression

Measures of depression and anxiety were scored on a 100-point scale and compared to baseline measurements. At 12 months, participants in the self-monitoring group were more depressed, scoring 6% higher, on average, on the depression subscale of the well-being questionnaire ( $P=.01$ ) than those in the control group. There was a trend toward increased anxiety in the self-monitoring group, but no significant differences in well-being, energy, or any of the other diabetes attitude subscales.

### WHAT'S NEW

#### ■ Less may be better

Because we emphasize self-management skills when we counsel patients about diabetes, it is surprising to learn that knowledge about glycemic control and blood sugar levels does not lead to better glycemic control. This RCT provides strong evidence that more information is not necessarily desirable, at least for patients with newly diagnosed type 2 diabetes who do not need insulin.

Depression is a known complication of diabetes. It affects an estimated 10% to 30% of patients with diabetes, who have double the odds of depression compared to people without diabetes.<sup>11,12</sup> Patients with depression and diabetes have poorer glycemic control,<sup>13,14</sup> an increased risk of complications,<sup>15-17</sup> a decreased quality of life,<sup>18</sup> an increased disability burden,<sup>19,20</sup> and increased health care use and costs.<sup>18,21,22</sup> In addition, they face a significantly higher risk of death from all causes, beyond the risks associated with depression or diabetes alone.<sup>23</sup>

### CAVEATS

#### ■ Patients on sulfonylureas may be an exception

This study used metformin as the initial oral medication, with sulfonylureas reserved for those who did not reach target glycemic control with maximum metformin therapy. The number of patients tak-

ing sulfonylureas was 11 in the self-monitoring group and 6 in the control group. Because hypoglycemia is a concern in patients taking sulfonylureas, there may be a role for self-monitoring of blood glucose in these patients.

Also of note: This study does not provide definitive evidence that self-monitoring of blood glucose causes harm. Although self-monitoring was associated with a 6% higher score on a depression subscale and a trend toward increased anxiety, overall satisfaction with treatment was similar in both groups. Additional studies are needed to better understand the relationship between self-monitoring and depression.

**Self-monitoring may still be a good idea for certain patients**, regardless of their diabetic medication regimen. When evaluating the potential benefits of self-monitoring of blood glucose, physicians should consider the individual's predisposition to depression, among other concerns.

### CHALLENGES TO IMPLEMENTATION

#### ■ Hard to forego a practice that everyone expects

Self-monitoring serves different purposes for different populations. Blood glucose levels, along with HbA1c, can guide clinicians in making treatment decisions. Knowing blood sugar levels may be educational or empowering to patients, and provides critical information if hypoglycemia is a concern. These considerations lead us to conclude that while self-monitoring is not indicated for all newly diagnosed diabetic patients, it should be considered in selected circumstances.

Because of the prevalence of self-monitoring of blood glucose, patients may see it as a key component of an optimal self-management regimen. It may be hard to convince patients with newly diagnosed diabetes otherwise—and to convince some clinicians that there is little benefit in recommending it. Again, clinical judgment is required. We suspect, however, that with the proper explanation, many

### FAST TRACK

**Those in the self-monitoring group were more depressed, scoring 6% higher, on average, on the depression subscale than the controls**

patients will be relieved to learn that they will not have to prick their fingers regularly or record their blood glucose. ■

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## FAST TRACK

### Having depression and diabetes significantly increases the risk of death from all causes

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